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Daubert, Frye, QC and AI—Oh My! Are Results Legally Admissible?

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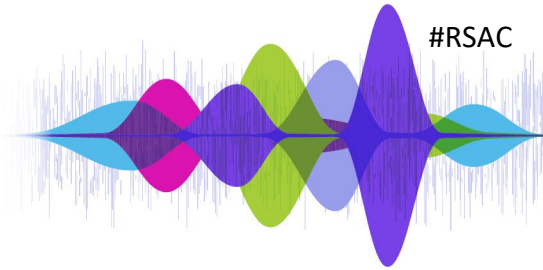

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Introduction

- Scientific Evidence—*Frye, Daubert*, and Evidence Rules
  - *Basics of Evidentiary Rules*
  - *Caselaw Updates*
- A brief primer on probabilistic (or non-deterministic) computing technologies.
  - *Generative Artificial Intelligence*
  - *Quantum Computing*
- Admissibility of AI and QC Output
  - *Wild guess or Studied prediction?*

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Daubert and *Frye* Explained

(And a primer on the Federal Rules of Evidence)

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Evidence 101

- Admissibility Requirements
  - **Relevant**: tending to make a fact of consequence more or less probable (FRE 401).
  - **Probative Value vs. Unfairness**: value of evidence, even if highly relevant, cannot be outweighed by "*unfair prejudice*" or the "*potential to mislead the jury.*" (FRE 403).
  - **Authenticated**: the item is what the proponent claims it is (FRE 901).
  - [**Not Hearsay**]: a statement that the declarant does not make while testifying that a party offers to prove the truth of the matter asserted (FRE 801).

Daubert v. Frye – A Battle of Scientific Evidence

Daubert v. Merrill Dow (1993)

- **Supreme Court** case establishing new Federal standard and codified as FRE 702
- Followed by many (but *not* all) states.
- **Active role** for judge; helps prevent "junk science"
- **Multi-factor**, non-exclusive reliability test (at cost of judicial effort)

Frye v. United States (1923)

- D.C. Circuit Court of Appeals decision
- Still followed by *some* states (~5)
- Established the "**general acceptance**" standard for determining admissibility of scientific evidence
- **Limited role** for judge; examine scientific community's consensus
- Tends to "**miss**" emerging science

The *Daubert* Factors

Non-Exclusive Reliability Factors for Expert Methodology

- Testability (Falsifiability)
- Peer Review and Publication
- Known or Potential Error Rate
- Standards and Controls
- General Acceptance (but *not* dispositive)

Federal Rule of Evidence 702

A witness who is **qualified as an expert** by *knowledge*, *skill*, *experience*, *training*, or *education* may testify in the form of an opinion or otherwise if the proponent demonstrates to the court that it is more likely than not that:

(a) the expert's scientific, technical, or other specialized knowledge will **help the trier of fact** to understand the evidence or to determine a fact in issue;

(b) the testimony is based on **sufficient facts or data**;

(c) the testimony is the product of **reliable principles and methods**; and

(d) the expert's opinion reflects a **reliable application** of the principles and methods to the facts of the case.

Application in Civil Cases

- Used with:
  - Expert reports, scientific tests, statistical models, forensic tools
  - Examples:
    - Breathalyzer for Blood Alcohol Content
    - DNA Testing
- Methodology vs. Conclusions
  - Notably, however, the Court also has found that "conclusions and methodology are not entirely distinct from one another," particularly where "there is simply too great an analytical gap between the data and the opinion proffered"

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Non-Probabilistic Computing Paradigms

Generative AI and Quantum Computing

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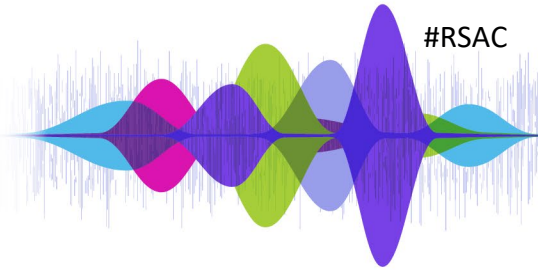
What is Probabilistic Computing?

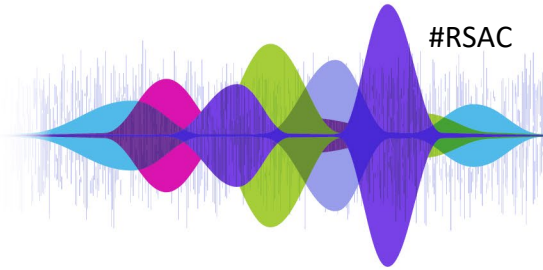


- **Traditional Computing**: Fixed Inputs → Fixed Outputs
  - Computers “do what they are programmed to do”
  - Bugs are inevitable but can be explained
- **Non-deterministic Computing**: Relies on *probabilities*
  - AI/ML Models *make predictions* based on **patterns** and are *trained* not programmed
  - Quantum computing *uses qubits and superposition* to (allegedly) compute **multiple possibilities** simultaneously

AI and Explainability Issues

- **Types of AI** relevant to legal evidence:
  - Machine learning (pattern recognition)
  - Deep learning (neural networks)
  - Generative AI (*creation* of summaries, text, images)
- **Black-Box Problem**: many AI models lack *human-interpretable reasoning*
- **Error Rates and Biases**
  - AI models depend on *training data*, assumptions, and context
  - Courts demand testability, transparency, and scientific validation

Quantum Computing – An Emerging Legal Challenge



Strengths

- Faster calculations
- Stronger encryption breaking

Weaknesses

- Error rates
- Hardware limitations
- Statistical outputs

Legal Use Cases

Cryptography | Simulations in Toxic Tort cases | Financial Modeling

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Admissibility of Non-Deterministic Computing Output

Yes, this is speculation!

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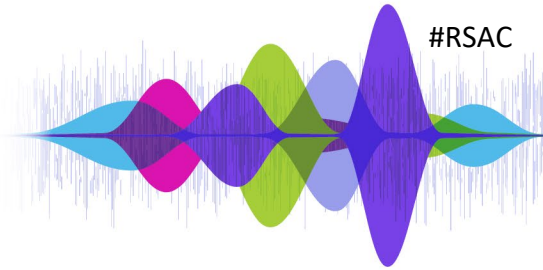
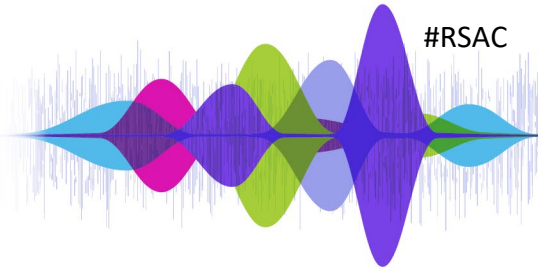
Threshold Issues: Relevance, Authentication, and Prejudice



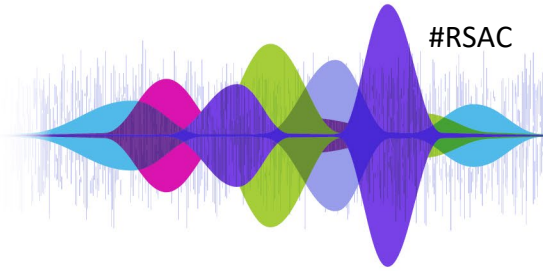
- FRE 702 (*Daubert*) and 901 (Authentication)
  - Who can authenticate?
- AI-generated evidence: **real** or **synthetic** (deepfake)
- QC Outputs: Can they be **independently verified**?
- Rule 403 concerns: Does probabilistic computing **mislead the jury**?

Key Court Decisions on AI Evidence



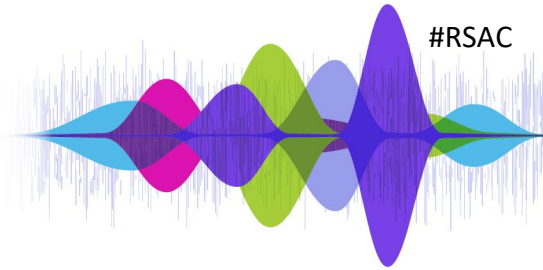
- *State v. Puloka* (Wash. 2024) – AI-enhanced video evidence using "Topaz Labs AI" **excluded** as **not generally accepted by the video forensic analysis community**
- *In re Celsius Networks,* 655 B.R. 301 (2023) – AI-generated expert report **struck for unreliability** under Rule 702 (*Daubert*)
- *People v. Wakefield* (NY 2022) – AI-based DNA software **admitted under *Frye*** as generally accepted in scientific community (Cybergenetics' TrueAllele software)

Authentication Challenges – Proving AI and QC Outputs are Reliable



- AI-generated documents (e.g., AI summarization or AI-written reports) may require **human validation**
- Courts demand **explainability, peer review, and transparency**
- Proposed evidence rule changes to account for AI (**Rule 901 revisions**)
- Discovery implications – AI generated evidence must be **fully disclosed and tested.**

Legal Arguments For and Against Admitting AI and QC Evidence



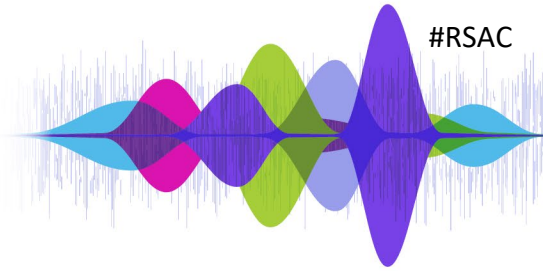
Proponents

- AI can be **more accurate**, **efficient, and consistent** than humans
- **Necessity** in extremely complex cases
- **Proven reliability** after techniques have been peer-reviewed and accepted
- AI is widely used in science and industry, so courts should **catch up**

Opponents

- Lack of **transparency** and **explainability** makes AI unreliable
- AI and QC can produce **biased, misleading, or error-prone results**
- **Jury confusion risk** – are non-deterministic computing results too complex to interpret?
- **Precedent of caution** – polygraph results remain unreliable and subject to challenge

Practical Considerations for Lawyers and Judges



- When to **challenge AI/QC evidence** under *Daubert/Frye*
- When to **lay a proper foundation** for AI/QC-generated evidence
- Best practices for **ensuring transparency, reliability, and fairness**
  - NIST AI Risk Management Framework
  - ISO 42001
- Future trends: **Will AI and QC evidence become routine, or face stricter scrutiny?**

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Conclusion and Application

Application? *Be Aware*…

- Of how you may become **reliant** on AI/QC output in the future in ways that could impact your organization's legal rights and obligations.
- Of the technologies you use that could become **evidence** in a legal dispute and how *Daubert/Frye* could be used to **challenge** that evidence.
- Of developments in the science and understanding of advanced technologies—particularly AI/QC—and such developments impact **reliability, explainability,** and **admissibility.**

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Thank You

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